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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/997,345	11/29/2001	Marcel Heerman	P01,0396	6066
26574	7590	10/03/2003	EXAMINER	
SCHIFF HARDIN & WAITE 6600 SEARS TOWER 233 S WACKER DR CHICAGO, IL 60606-6473			VU, HUNG K	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/997,345

Applicant(s)

HEERMAN, MARCEL

Examiner

Hung K. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 16-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 16-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to. ✓
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Request for Continued Examination***

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/18/03 has been entered. An action on the RCE follows.

The indicated allowability of claims 1-10 is withdrawn in view of the newly discovered reference(s) to Gnadinger (US 5,229,647) and reference submitted by Applicant to Johnson et al. (GB 2349014). Rejections based on the newly cited reference(s) follow.

### ***Claim Objections***

2. Claims 9 and 16-24 are objected to because of the following informalities:

In claim 9, line 3, "a semiconductor" should be changed to "the semiconductor" for clarity.

In claim 9, line 4, "a metal" should be changed to "the metal" for clarity.

In claim 16, last line, "an external" should be changed to "said external" for clarity.

In claims 17-24, line 1, "A semiconductor" should be changed to "The semiconductor" for clarity.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gnadinger (PN 5,229,647) in view of Johnson et al. (GB 2349014, of record).

Gnadinger discloses, as shown in Figures 4 and 6, an intermediate base (10) for a module having at least one semiconductor component (upper 10), the base comprising a flat base body having an upper face on which internal connections are formed for connection to connecting elements of a semiconductor component, a lower face which is provided with external connections for making contact with a circuit carrier, and through-holes (21) between the upper face and the lower face, the through-holes having walls which are at least partially metallized to make a conductive connection (28) between an internal connection (22) on the upper face and a corresponding external connection on the lower face.

Gnadinger does not disclose the walls of the through-holes being at least partially exposed in the region of the lower face of the base body by means of annular notches which are incorporated adjacent to a circumferential edge of the through-holes to form freestanding studs external connections. However, Johnson et al. discloses the walls of the holes being at least partially exposed in the region of the lower face of the base body by means of annular notches (43,56,76,83,216) which are incorporated adjacent to a circumferential edge of the holes to form

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freestanding studs external connections. Note Figures 2-4 and 9-10 of Johnson et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the base body of Gnadinger having the walls of the through-holes being at least partially exposed in the region of the lower face of the base body by means of annular notches, such as taught by Johnson et al. in order to reduce thermally induced strains on solder joints.

With regard to claims 2 and 18, Gnadinger and Johnson et al. disclose annular notches are concentric to form tubular studs.

With regard to claims 3 and 19, Gnadinger and Johnson et al. disclose at least one of the notches is eccentric so that the stud associated therewith is approximately in the form of a tubular segment.

With regard to claims 4-5, 16 and 20, Gnadinger and Johnson et al. disclose the invention substantially as claimed as recited in the rejection above. Gnadinger and Johnson et al. do not disclose the material of the base body. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the base body of Gnadinger and Johnson et al. having the materials as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With regard to claims 6 and 21, Gnadinger and Johnson et al. disclose the external connections

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are in the form of metal layers (28) on an outer rim of the studs.

With regard to claims 7 and 22, Gnadinger and Johnson et al. disclose the external connecting elements have an additional solder layer (20).

With regard to claims 8 and 24, Gnadinger and Johnson et al. disclose the through-holes are at least partially filled with a solder material (20).

With regard to claims 9 and 24, Gnadinger and Johnson et al. disclose the internal connections on the upper face of the base body are formed by a metal layer (22) on the component connecting elements of the semiconductor components which is connected to the upper face, with the metal layer continuously covering both the walls of the through-hole and the contact surface of the component connecting elements which faces the through-hole.

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (703) 308-4079. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular

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communications and (703) 308-7722 for After Final communications, or (703) 872-9306 for Central Fax Number.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

September 16, 2003

A handwritten signature in cursive script, appearing to read "Hung Vu", written over a horizontal line.

Hung Vu

Patent Examiner